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## Mihai Gheorghiade MD – Life and Concepts

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“I have the simplest of tastes. I am always satisfied with the best.”

– Oscar Wilde

How do you capture an idea, shape it, and then bring it into the world? Of his many talents, this ability was a fundamental characteristic of Mihai Gheorghiade. A quick glance through PubMed confirms his prodigious output, likely to overwhelm any novice or even expert scholar. His contribution to heart failure, especially acute heart failure (AHF), is profound. He authored several major concepts in acute heart failure, disseminated further by his students. Most concepts remained indelibly linked to his name: Digoxin trials research(1–3), AHFS (acute heart failure syndromes) definition(4), hemodynamic congestion(5), hospitalized heart failure (HHF) (6), the vulnerable phase(7,8), neutral hemodynamic agents(9), registries(10–12) and pre-trial registries(13), the “6-axis model”(14) and then the “8-axis model”(15). His work shaped the field of AHF.

Reviewing the chronologic history of his tremendous scientific output is best described as a review of a best-selling novel: a brilliance and force of thought, a literary juggernaut. You might not agree, but you read, you listened.

Unfortunately, there is no PubMed of his life; the way he lived, the larger than life personality that exuded energy and an inhuman devotion to his work. The impact he had on his students, residents, fellows, colleagues, and friends extends far beyond the authorship byline. While the compendium that follows shares a brief review of some of the most important concepts authored by Mihai, we wanted to share a bit about his life.

Ask anyone who knew him and they will tell you one, if not many, Mihai stories. These are special, treasured and quickly identify those who knew him well. He challenged you, yet at the same time was very clear he didn’t have all the answers. But he always had a question.

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However, the best were the stories of his own life, his struggles as an immigrant, his realization that clinical research was where he wanted to make his mark. For me, the stories came later in his life. It is when others who knew him gather together, telling a more chronologic tale, that the picture became more complete. The stories are not about perfect though. Like all of us, he was not a perfect man. However, he was a brilliant man; besides, perfect men don't exist and for certain, don't change the world.

My story with Mihai begins in 2007. As I write this, I can see him; that smile, mustache, impeccably dressed, the accent, and the question: "what is acute heart failure?" He loved asking these types of questions. At first glance, it seems such an odd question or too broad. But once you knew him a bit more, you better understood the depth. What is acute heart failure? How do we define it? If we don't share a common definition, how will we study it, build upon a common framework? One of his landmark papers, published in *Circulation* in 2005, addresses this daunting question head on, becoming the definition of AHF most commonly used today. He was the single greatest influence on my academic career, the greatest mentor I ever had. To this day, when my wife and I celebrate our many blessings, we always raise a toast to Mihai.

## Peter Pang

I knew him since 2005. In the beginning, he would call, usually very early in the morning, asking about the various manuscripts we had started. Our conversations were never in one language, rather a mélange of English, Romanian and Italian. In the last year, we talked every day, discussing a range of topics, from papers, history, the next economic crisis, friends and friendship, mentorship.

Papers frequently resulted from these long phone calls, when he dictated the structure and main ideas. I never had a written review; he was always very critical, constructive, keeping an excellent sense of humor. He told me: "Just imagine that you are the reviewer for this manuscript; probably you will reject it." He was very eager to find simpler answers with potential clinical implications. He set "the patient first" in a world where other interests are first. Details mattered, telling me "the excellence is the sum of the small details." He was committed to excellence and he disseminated it. He shaped my career and my way of thinking.

## Ovidiu Chioncel

Early in my career, I joined a group of cardiologists at a HF meeting. I had never met Mihai before, and I was clearly the junior investigator in the room. At the first break, Mihai pulled me aside and spoke with the conviction he embodied so well; "You must speak up, all of these people in the room have no idea what happens in the first 6–12 hours of heart failure care. Don't be afraid to tell them they are wrong – because they are. We need to change the landscape of current heart failure trials. You need to lead this discussion." I remember going back to my seat and feeling unsure as to whether I should say anything. Once the discussion resumed, Mihai spoke up and said "We have this all wrong- these patients look much different when they present to the hospital. Sean, tell them how this really is." And this

launched my long-standing relationship with Mihai. This first interaction was a good peek into what my collaboration with Mihai was like, and that was how many of our conversations proceeded over the next decade. Brief, challenging, and forward thinking best described our frequent discussions. Frequently I would receive a brief email: “call me” or “we need to talk”. I knew it was time for another tutorial. I will miss his mentorship, friendship and frequent challenges.

## Sean Collins

One of the luckiest days of my career was during an annual heart failure meeting on Amelia Island in 2010. I was working in the lobby and saw Mihai pacing up and down the corridor. I did not know him well, but eventually, he sat down next to me. As we talked, I learned his car service was late and he needed to get to the airport. Such small-talk quickly morphed into an argument about vasodilator use in heart failure. He left when his car arrived but emailed me that night asking for my phone number. He called me the same night and we talked for a long time. I was surprised as to why he would give so much time and attention to the topic, especially so late at night. This was the beginning of my relationship with Mihai. At the time of his death, we had published over 100 papers together, several were in development stage, mentored several young investigators, and were involved in many other initiatives, and became best of friends. As I reflect on those two initial experiences – why was he so passionate about vasodilators and why is he taking time out late at night to talk about it – I came to realize that is who he was. I enjoyed 7 years of Mihai’s late night phone calls, fueled by his enthusiasm and passion for his work.

## Javed Butler

For a man who loved writing, a defining characteristic few would believe: he couldn’t type. Ironically, this flaw may have been one of his greatest assets. It brought a natural cohesiveness for mentor and mentee. Documents did not evolve through a to and fro of track changes. Mentees spent time at his desk or on the phone with him. They articulated his passion into the manuscript, while simultaneously receiving irreplaceable one-on-one mentoring. He was never more enthusiastic than when supporting new collaborations between young minds in different countries.

Given his incredible scholarly output, only those who had the privilege to work side by side, day in, day out, were able to witness this characteristic. Imagine sitting side by side, discussing and writing concepts, sentences, reviewing older papers! For some, such a model would be fire and brimstone! But for me and countless others, a reflection of the apprenticeship model of medicine. If you want to learn, come sit by me, watch, listen, type, learn! These were not mere exercises; rather they shaped the relationship, taught both parties so much about each other. And you had to earn the time to type for him! Late evenings, weekend mornings...sometimes there would be a line of us waiting to sit in the chair to type! In retrospect, the outpouring of scholarly output seems the secondary outcome. A “Bravo!” from Mihai at the end of one of these sessions was the highest praise.

While the data driven papers were the gold, it was the discussion section, the commentaries or editorials that was the art. Now was the time to dissect, to reflect, to set the stage, to strategize. The data was the data – interpreting the data was the lesson, and articulating the unmet need, critical next steps, and subsequent path forward was the goal for such documents. Don't describe the current state, but tell the audience where we need to go, and then take them there.

Ultimately, for a brief, intense period, he was a like a second father to me. For 2 years, we talked every day, no matter where he was in the world, no matter the holiday. For those who knew him, it is an easy truth. Such time shapes a person, leaves an imprint. For example, his love of digoxin! And papers! And good suits, and fast cars and a respect for being so facile in so many languages. What he taught me, he taught all who had the privilege to work with him:

1. Be passionate about your work
2. Ask the important question and go after it!
3. Write, write, and write!
4. Clinical trials – the ultimate scientific experiment.
5. Earn and enjoy the very best life has to offer.

In the pages to follow are some of the many concepts on AHF from Mihai Gheorghiade. For all of us who knew him, we hope this provides a chance to glimpse of the person we all miss so very much.

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